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**SHORT COMMUNICATION**

# *Styphelia quartzitica* and *S. rectiloba* (Ericaceae: Epacridoideae: Styphelieae), two new, morphologically anomalous species of restricted distribution

Recently published research by Puente-Lelièvre *et al.* (2016) dealing with the molecular phylogeny of the large *Styphelia* Sm.–*Astroloma* R.Br. clade has led to the adoption of a greatly enlarged circumscription for *Styphelia* (Crayn *et al.* 2019). The sampling of the Western Australian taxa for that project was both relatively dense (96 taxa, or about two-thirds of the western members of the clade were sampled) and strategic, with all major morphological groups included, in addition to most of those taxa that showed no clear morphological affinities. However two uncommon species, which did not fit well with any morphological group, were not sampled. While their closer affinities are uncertain and will require further molecular investigation to resolve, there is little reason to doubt that the two are *Styphelia* in the newly expanded sense. They are described below.

**Styphelia quartzitica** Hislop, *sp. nov.*

*Typus*: Fitzgerald River National Park, Western Australia [precise locality withheld for conservation reasons], 17 May 2016, *M. Hislop* 4596 (*holo*: PERTH 08836639; *iso*: CANB, K, MEL, NSW).

*Leucopogon* sp. Barren Range (A.S. George 10092), Western Australian Herbarium, in *FloraBase*, https://florabase.dpaw.wa.gov.au/ [accessed 21 June 2019]

Erect *shrubs* to 60 cm high and 40 cm wide, single-stemmed at ground level from a fire-sensitive rootstock. Young *branchlets* with a dense indumentum of mostly retrorse hairs, 0.05–0.20 mm long. *Leaves* spirally arranged, crowded, variably antrorse, or occasionally some leaves ± patent; apex long-mucronate, pungent, mucro 0.4–1.0 mm long; base attenuate; petiole rather obscure, 0.3–0.8 mm long, shortly hairy on adaxial surface and margins; lamina linear or very narrowly ovate, 7–14 mm long, 0.8–1.5 mm wide, flat or adaxially concave, the longitudinal axis gently incurved, usually distinctly twisted; surfaces markedly discolorous, shiny; adaxial surface shortly and sparsely hairy, ± transversely rugose, the venation not evident; abaxial surface paler, glabrous, with 5 flat or slightly raised primary veins; margins glabrous or minutely scabrid. *Inflorescence* axillary, widely spreading; axis 1.4–2.6 mm long, 1- or less often 2-flowered, ± terete in lower portion, plano-convex above the fertile node, terminating in a bud-rudiment; axis indumentum moderately dense, *c.* 0.1 mm long; flowers widely spreading, sessile. *Fertile bracts* broadly ovate to depressed-ovate, 0.4–0.6 mm long, 0.4–0.6 mm wide, subtended by 4 or 5 sterile bracts. *Bracteoles* broadly ovate to depressed-ovate, 1.0–1.3 mm long, 1.0–1.4 mm wide, obtuse; abaxial surface not keeled, glabrous, greenish, ± striate; margins minutely ciliolate. *Sepals* narrowly ovate, 2.8–3.6 mm long, 1.2–1.3 mm wide, acute or subacute, shortly mucronate; abaxial surface glabrous, pale greenish to straw-coloured, venation obscure; adaxial surface with a discrete patch of very short, sparse hairs close to the base; margins minutely ciliolate, with hairs < 0.05 mm long. *Corolla tube* cream, ± cylindrical or narrowly obovoid, longer than the sepals, 3.0–4.5 mm long, 1.7–2.2 mm wide, glabrous externally; internal surface densely hairy in a medial


https://florabase.dpaw.wa.gov.au/nuytsia/
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band, glabrous at base. *Corolla lobes* cream, shorter than the tube, 2.0–2.5 mm long, 1.0–1.2 mm wide at base, erect in lower 1/2–2/3 of their length and then spreading and recurved; glabrous externally, internal surface with a sparse indumentum of twisted and ornamented hairs, concentrated towards the margins. *Filaments* terete, 0.3–0.4 mm long, attached to anther 2/3–3/4 above base, adnate to tube just below sinuses. *Anthers* partially exserted from the tube (by 1/3–1/2 of their length), 1.2–1.3 mm long, apex rounded to shallowly emarginate. *Nectary* annular, shallowly lobed, 0.3–0.4 mm long, glabrous, usually grooved longitudinally below the sinuses. *Ovary* pale green, narrowly ovoid, *c.* 1.3–1.6 mm long (but refer comments under notes below), 0.6–0.8 mm wide, glabrous, 5-locular. *Style* glabrous or minutely papillose in the upper half, *c.* 2.3–3.6 mm long (but refer comment under notes below), tapering smoothly from ovary apex, with stigma presented at the top of the corolla tube; stigma not or barely expanded. *Fruit* narrowly ellipsoid or obloid, 3.2–4.0 mm long, 1.6–1.8 mm wide, much longer than the calyx; surface glabrous, with longitudinal grooves, mesocarp poorly developed; gynophore absent; style persistent. (Figure 1)

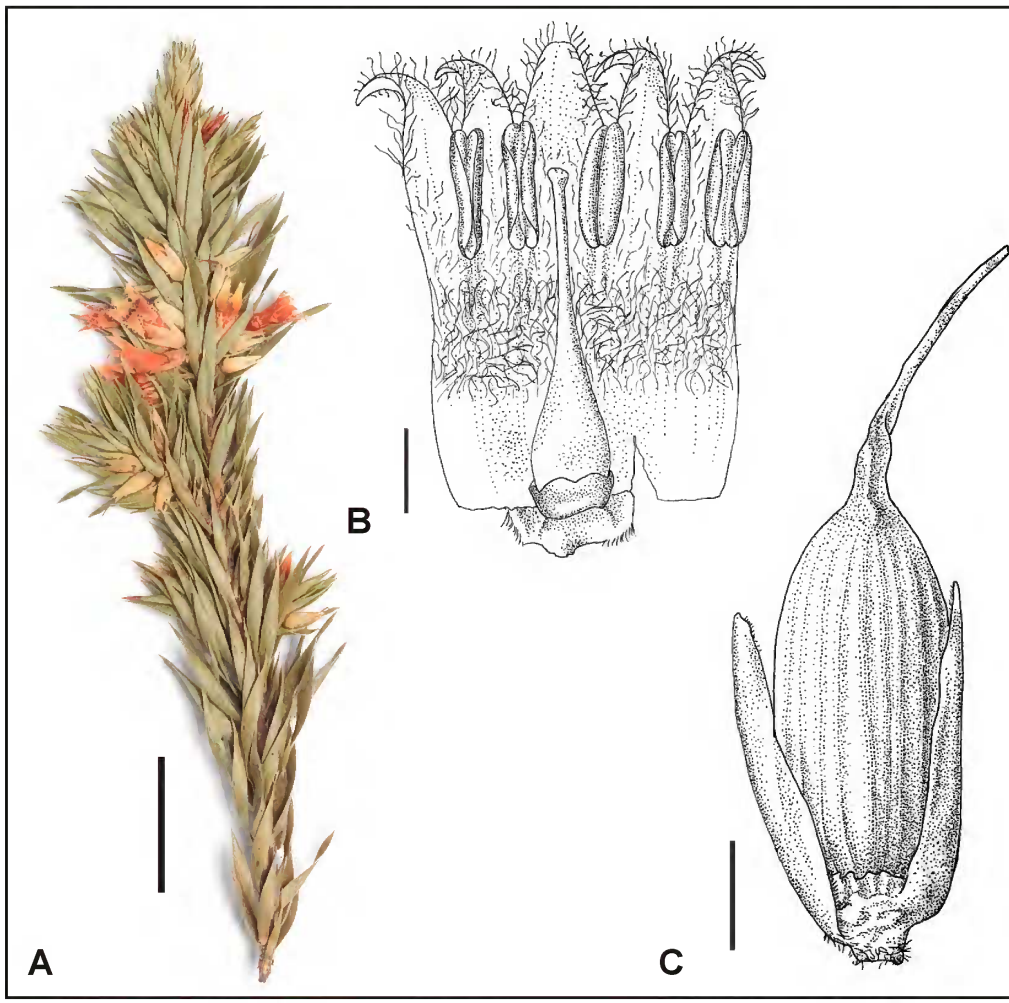


Figure 1. *Styphelia quartzitica*. A – scanned image of flowering branchlet; B – flower, slit open longitudinally; C – fruit. Scale bars = 1 cm (A), 1 mm (B & C). Vouchers: *M. Hislop* 4596 (A & B), *M. Hislop* 3040 (C). Drawings by Skye Coffey.

*Diagnostic characters*. Readily distinguished from all other western *Styphelia* by the following combination of characters: leaves linear, longitudinally twisted; internal surfaces of corolla lobes with a sparse indumentum concentrated towards the margins; internal corolla tubes with a medial band of dense hairs; fruit ± dry, longitudinally grooved, narrowly ellipsoid or obloid, lacking a gynophore.

*Other specimens examined*. WESTERN AUSTRALIA: [localities withheld for conservation reasons] 4 Aug. 1995, *S. Barrett* 323.1 (PERTH); 26 Nov. 2002, *S. Barrett* 1054 (PERTH); 9 Oct. 2007, *S. Barrett* 1648 (PERTH); 26 Mar. 2012, *S. Barrett* 2094 (PERTH); 16 July 1970, *A.S. George* 10092 (PERTH); 10 Oct. 2003, *M. Hislop* 3034 (CANB, NSW, PERTH); 10 Oct. 2003, *M. Hislop* 3040 (MEL, PERTH); 28 Nov. 2002, *M. Hislop, S. Barrett & J.A. Cochrane* MH 2876 (PERTH); 30 May 1970, *K.R. Newbey* 3164 (PERTH); 17 Sep. 2011, *D.A. Rathbone* 997 (PERTH); 22 Sep. 2011, *D.A. Rathbone* 998 (PERTH).

*Distribution and habitat*. Restricted to the upper slopes of quartzite hills and mountains in remote parts of the Fitzgerald River National Park within the Esperance Plains bioregion (Department of Environment 2013). Grows in shallow sandy soils over quartzite in the understory of dense heath. Commonly associated species include *Regelia velutina*, *Melaleuca lutea*, *Agonis baxteri*, *Taxandria conspicua* and *Banksia oreophila*.

*Phenology*. Apparently has a prolonged flowering period with a peak most likely between March and May, although flowering collections have been made as late as October. Specimens with mature fruit have been collected between July and November.

*Etymology*. The epithet is Latinised from quartzite and refers to the rock type on which the species is found.

*Conservation status*. Currently listed by Smith and Jones (2018) as Priority Two under Conservation Codes for Western Australian Flora under the name *Leucopogon* sp. Barren Range (A.S. George 10092). All populations of this species are conserved in the Fitzgerald River National Park. However its occurrence there is very localised and habitat-specific.

*Affinities*. *Styphelia quartzitica* is a very distinctive species and no close morphological affinities are apparent with any of the species-groups resolved in the recent molecular phylogenetic study (Puente-Lelièvre *et al*. 2016).

The unevenly distributed corolla lobe hairs and dense medial band of hairs in the internal corolla tube are both unusual features for the genus. The conspicuously twisted leaves are another uncommon attribute.

*Notes*. Because the style tapers so gradually from the ovary apex in this species the given measurements for the ovary and style lengths are necessarily imprecise.

**Styphelia rectiloba** Hislop, *sp. nov.*

*Typus*: west of Kambalda, Western Australia [precise locality withheld for conservation reasons], 23 May 2013, *M. Hislop* 4249 (*holo*: PERTH 08514054; *iso*: CANB, MEL, NSW).

*Leucopogon* sp. Kambalda (J. Williams s.n. PERTH 07305028), Western Australian Herbarium, in *FloraBase*, https://florabase.dpaw.wa.gov.au/ [accessed 21 June 2019]

Spreading, compact *shrubs* to *c.* 1.5 m high and 1.5 m wide, branching from close to base but probably with a fire-sensitive rootstock. Young *branchlets* with a sparse to moderately dense indumentum of very short, patent hairs, < 0.05 mm long. *Leaves* spirally arranged, variably antrorse; apex long-mucronate, pungent, the mucro 0.8–2.0 mm long; base rounded to cuneate; petiole well-defined, 0.5–1.0 mm long, usually with a few hairs about the adaxial surface and margins or ± glabrous; lamina ovate to narrowly ovate, 6–11 mm long, 2.3–3.5 mm wide, strongly concave adaxially, the longitudinal axis variable, from distinctly incurved to distinctly recurved; surfaces discolorous; adaxial surface glabrous, ± glaucous on younger leaves, becoming shiny, the venation not or barely evident, often with transverse striations; abaxial surface paler, matt, with 5 usually slightly raised primary veins, openly grooved or flat between veins, glabrous or very shortly and sparsely hairy; margins glabrous, irregularly denticulate. *Inflorescence* axillary, erect; axis 2.4–3.5 mm long, 1–3(4)-flowered, ± terete basally, becoming sharply angular in flowering portion, terminating in a bud-rudiment; axis indumentum moderately dense to *c.* 0.2 mm long; flowers erect, sessile. *Fertile bracts* ovate or broadly ovate, 0.7–1.2 mm long, 0.7–1.0 mm wide, subtended by 4 or 5 sterile bracts. *Bracteoles* ovate-elliptic 1.8–2.5 mm long, 1.4–1.6 mm wide, obtuse to ± retuse; abaxial surface not keeled, shortly and sparsely hairy, greenish but often tinged brown at least in the upper half; margins glabrous or minutely ciliolate. *Sepals* narrowly ovate, 3.8–4.5 mm long, 1.4–1.7 mm wide, obtuse with a short, subapical mucro; abaxial surface shortly hairy towards apex, glabrous below, initially greenish, but soon becoming brown, at least in the distal half, venation obscure; adaxial surface glabrous; margins ciliate with hairs to 0.2 mm long, mostly towards the apex. *Corolla tube* cream, cylindrical, usually slightly shorter than, to occasionally distinctly longer than, the sepals, 3.4–4.2 mm long, 1.3–1.6 mm wide; external surface usually with a few long hairs in lines; internal surface hairy in the upper 2/3, glabrous below. *Corolla lobes* cream, shorter than the tube, erect for up to *c.* 1/4 of their length and then spreading and recurved (but refer to comment under Affinities heading below), 2.4–3.2 mm long, 0.8–1.0 mm wide at base, glabrous externally; internal surface with a rather sparse indumentum of twisted and ornamented hairs. *Filaments* terete, 0.7–0.9 mm long, attached to anther 2/3–3/4 above anther base, adnate to tube just below sinuses. *Anthers* fully exserted from the tube and held at right angles to the floral axis post-anthesis, 1.2–1.4 mm long, apex emarginate. *Nectary* partite, the scales 0.45–0.55 mm long, 0.35–0.45 mm wide, glabrous. *Ovary* pale yellow-green, globose to ellipsoid, 0.6–0.8 mm long, 0.5–0.6 mm wide, hairy, 3-locular. *Style* sparsely hairy in lower 2/3–3/4, scabrous above, 4.2–5.3 mm long, tapering smoothly from ovary apex, well-exserted from the corolla with the stigma presented well beyond the corolla lobe bases and anthers; stigma expanded. *Fruit* narrowly ellipsoid, *c.* 3.0–4.0 mm long, 1.5–2.0 mm wide (but see comment under *Notes* below), *c.* equal to the sepals, surface sparsely hairy, with irregular, raised, ribs representing the dried mesocarp; gynophore absent; style shed at or close to maturity. (Figure 2)

*Diagnostic characters*. Readily distinguished from all other western *Styphelia* by the following combination of characters: leaves ovate, strongly concave adaxially with irregularly denticulate margins and pungent, long-mucronate apices; corolla lobes straight and sharply reflexed on dried specimens; anthers exserted from the tube and held at right angles to the floral axis post-anthesis; ovary hairy, 3-locular, style hairy at least in the lower half; fruit narrowly ellipsoid, with a thin mesocarp, lacking a gynophore.

*Other specimens examined*. WESTERN AUSTRALIA: [localities withheld for conservation reasons] 13 Jan. 2006, *V. Clarke* VTC 647 (NSW, PERTH); 10 May 2012, *M. Hislop* 4194 (PERTH); 10 May 2012, *M. Hislop* 4197 (K, PERTH); 14 Dec. 2011, *J. Warden* 33627 (PERTH); May 2005, *J. Williams s.n.* (PERTH); 10 June 2013, *V. Yeomans & A. Sleep* VY 840-05 (PERTH).

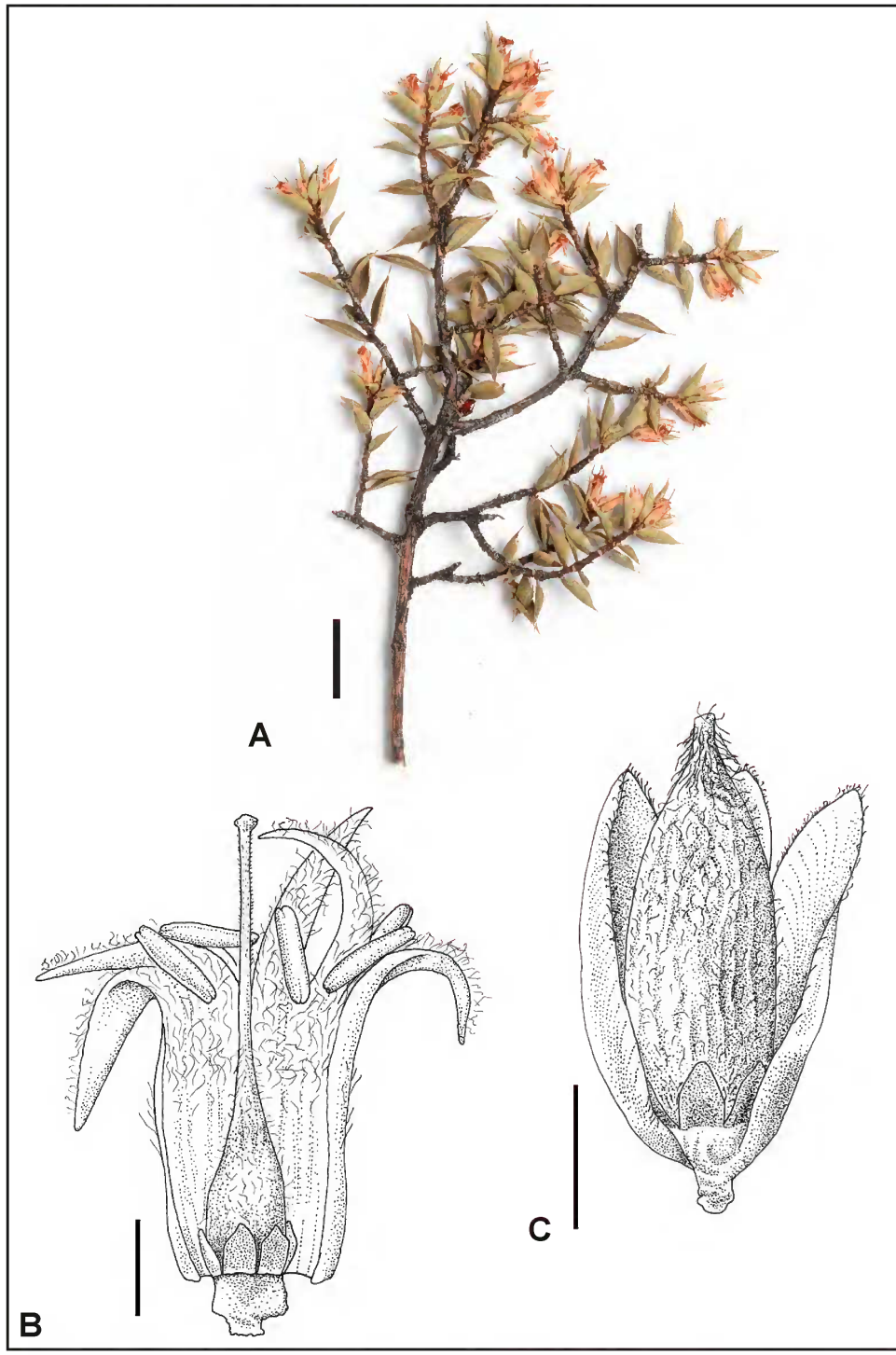


Figure 2. *Styphelia rectiloba*. A – scanned image of flowering branchlet; B – flower, slit open longitudinally; C – fruit. Scale bars = 1 cm (A), 1 mm (B & C). Vouchers: *M. Hislop* 4249 (A), *M. Hislop* 4197 (B & C). Drawings by Skye Coffey.

*Distribution and habitat*. Currently only known from a few populations in the Kambalda area of the Coolgardie bioregion (Department of Environment 2013) where the species is restricted to rocky, skeletal soils, on and in close proximity to, decomposed granitic breakaways. The associated vegetation is very open woodland or heath with *Eucalyptus stricklandii*, *Melaleuca leiocarpa*, *Alyxia buxifolia* and *Ptilotus helichrysoides* among the more frequently encountered species.

*Phenology*. Flowering specimens have been collected between December and June. The only collection to include mature fruit was made in May. Peak flowering is probably dependent on the extent and pattern of rainfall through the summer months but in average seasonal conditions it is likely to be between March and May. Fruit are likely to be present at least between May and September.

*Etymology*. From the Latin *recti-* (straight) and *lobus* (lobe), in reference to the noticeably straight axis of the dried corolla lobes (see *Affinities* below).

*Conservation status*. Listed by Smith and Jones (2018) as Priority Three under Conservation Codes for Western Australian Flora under the name *Leucopogon* sp. Kambalda (J. Williams s.n. PERTH 07305028). This species is localised, habitat-specific and known from very few populations. However it does occur in a remote part of the state where there is considerable potential for the discovery of new populations. Surveys are needed to better understand the extent of its distribution.

*Affinities*. As with *S. quartzitica* described above, *S. rectiloba* has no obvious morphological affinities with any of the species groups resolved in the recent molecular phylogenetic study (Puente-Lelièvre *et al*. 2016).

The epithet highlights an interesting feature of the species. Although there is nothing unusual in the orientation of the corolla lobes in live flowers, these being erect towards the base and then spreading and recurved above, when dried the lobes become straight and reflexed. This characteristic does not occur elsewhere in the western members of the genus. Another unusual feature relates to the disposition of the anthers. While the anthers are slightly exserted from the corolla tube at anthesis, once the pollen is shed they are held at right angles to the floral axis, and in so doing appear more prominent. The species is also notable for the presence of stylar hairs, an uncommon character in the western *Styphelia*.

*Notes*. The fruit measurements are based on a single fruiting collection and therefore cannot be regarded as definitive.

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## References

Crayn, D.M., Hislop, M. & Puente-Lelièvre, C. (2019). A phylogenetic recircumscription of *Styphelia* (Ericaceae: Epacridoideae: Styphelieae). *Australian Systematic Botany* (accepted 4 June 2019)

Department of the Environment (2013). Australia's *bioregions (IBRA)*. IBRA 7, Commonwealth of Australia. http://www.environment.gov.au/land/nrs/science/ibra#ibra [accessed 19 December 2018]

Puente-Lelièvre, C., Hislop, M., Harrington, M., Brown, E.A., Kuzmina, M. & Crayn, D.M. (2016). A five-marker molecular phylogeny of the Styphelieae (Epacridoideae, Ericaceae) supports a broad concept of *Styphelia*. *Australian Systematic Botany* 28: 368–387.

Smith, M.G. & Jones, A. (2018). *Threatened and Priority Flora list 5 December 2018*. Department of Biodiversity, Conservation and Attractions. https://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-plants [accessed 21 June 2019].

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